

Amendments to the Specification:

Please replace paragraph [0007] with the following amended paragraph:

[0007] In the aforementioned conventional art, linkages between functions necessary for a service and a way of relating the functions are described in a scenario. However, the way of relating devices and software having the functions varies depending on conditions of the devices and a situation of an sitearea where the service is actually provided using the devices. In some siteareas, there is a device having a plurality of functions, or in some siteareas, a plurality of devices have the same functions. Therefore, there are a plurality of ways of linking the devices having the functions described in the service scenario, and in some cases, a device configuration which is not suitable for the user's situation may be selected.

Please replace paragraph [0009] with the following amended paragraph:

[0009] Furthermore, in the aforementioned conventional art, as for the device having a plurality of functions, when a plurality of users receive respective services in the same sitearea, it is difficult to separately adopt the function for each user. Moreover, it is difficult to separately manage the operation of each function in each device.

Please replace paragraph [0010] with the following amended paragraph:

[0010] An object of the present invention is to provide a service based on a service scenario in general description by dynamically linking devices necessary to execute a service according to situations of users, conditions of devices, and the like without limiting an sitearea.

Please replace paragraph [0020] with the following amended paragraph:

[0020] FIG. 3 is a flowchart in executing a service in a local sitearea based on the service scenario;

Please replace paragraph [0031] with the following amended paragraph:

[0031] FIG. 14 is a view showing a way of managing devices and functions when a plurality of users simultaneously receive services at the same sitearea in providing the services;

Please replace paragraph [0040] with the following amended paragraph:

[0040] Hereinafter, the preferred embodiment of the present invention will be described in detail below with reference to the drawings. FIG. 1 is a view schematically showing a system to which a service according to the present invention is applied. Main components of the system are a user 0161, broker servers 0111 and 0112, devices 0121, 0122, 0123, 0124, and 0125, sensors 0131 and 0132, access points 0141 and 0142, a service scenario distribution server 0101, and the like. The user 0161 moves with a portable terminal 0151 which can perform wireless communication. The broker servers 0111 and 0112 are placed in each sitearea within an environment. The devices 0121, 0122, 0123, 0124, and 0125, the sensors 0131 and 0132, and the access points 0141 and 0142 are coupled to the broker servers 0111 and 0112 through field networks 0181 and 0182. The service scenario distribution server 0101 is coupled to the broker servers 0111 and 0112 through the Internet 0171. Herein, the field networks 0181 and 0182 are wired or wireless networks.

Please replace paragraph [0047] with the following amended paragraph:

[0047] FIG. 3 is a flowchart in executing the service at a local sitearea based on the service scenario according to the present invention. In ST0301, upon accepting a request from a user, the service to be executed is selected. In ST0302, the service scenario is downloaded from the service scenario distribution server to the broker server located near the position of the user. Alternatively, the service scenario saved in the user's terminal is sent to the broker server. In ST0303, the vicinity of the position of the user is searched for devices having functions necessary to execute the service, which are described in the service scenario. In ST0304, available devices are selected from the devices that are detected based on context conditions. In ST0305, correspondence between the selected devices to be used is determined based on the linkage between the functions described in the service scenario, the local device configuration, and the like, to create a correspondence table. Note that when the contexts change, the correspondence table is also immediately updated. In ST0306, the devices selected to execute the service are provided with the correspondence relations between the devices, information necessary to execute the service, and the like. In ST0307, the devices are linked to each other based on the correspondence table created in ST0305, thus executing the service. In ST0308,

when the contexts change during service execution, it is required to reconfigure the devices to be used for the service and the device linkages according to the new contexts, and the procedure returns to the process of ST0303. In ST0309, when the service is finished, the exclusive rights of the functions and the devices which have been used are released to end the device linkages.

Please replace paragraph [0050] with the following amended paragraph:

[0050] These contexts can be used not only on their own, but also in combination. The conditions of these contexts can be changed and set according to a service, installation locations of devices, types of the devices, attributes of a user, and the like. These conditions are held by a server or middleware arranged in each sitearea and referred to in order to link the devices according to the situation of the user during the service execution.

Please replace paragraph [0051] with the following amended paragraph:

[0051] FIG. 5 is a view showing a configuration of software in the broker server which dynamically links devices necessary for the service in providing the service according to the present invention. The broker server 0501 is placed in each sitearea within the environment and manages devices located in the sitearea. The main components of the broker sever are a device linkage creating section 0502, a service managing section 0503, a context managing section 0504, and a device configuration managing section 0505. The device linkage creating section 0502 creates a correspondence table 0509 of device linkages for providing the service. The service managing section 0503 manages the service scenario and execution of the service. The context managing section 0504 manages contexts in the sitearea. The device configuration managing section 0505 manages a device management database 0506 concerning the devices located in the sitearea, and sends messages concerning a procedure of linking the devices to the respective devices in providing the service.

Please replace paragraph [0052] with the following amended paragraph:

[0052] The service managing section 0503 receives the service scenario through a communication medium 0508. The context managing section 0504 acquires information from the sensors installed within the environment through the communication medium 0508, and always

monitors change in the contexts in the sitearea. The device configuration managing section 0505 acquires information from the devices located in the sitearea through the communication medium 0508, and manages the device management database 0506 to monitor the situations of the devices.

Please replace paragraph [0054] with the following amended paragraph:

[0054] FIG. 6 is a view showing the correspondence table between devices to be used, which is created in providing the service according to the present invention. The main components of the correspondence table are a name of a function 0601 necessary to execute the service, which is described in the service scenario; a name of a device 0602, in the vicinity of the user, having the relevant function necessary to provide the service; an identifier 0603, such as a network address, a name, or an object reference, for uniquely specifying the device having the relevant function necessary to provide the service in the local sitearea; a process 0604 in which the relevant functions necessary to provide the service are running in the device or software; a data source 0605, which is an identifier of the device or the process which sends data to the relevant process; and a data destination 0606, which is an identifier of the device or the process to which the relevant process sends data. In addition, the main components also include a state 0607 such as an operating situation of each device.

Please replace paragraph [0055] with the following amended paragraph:

[0055] In executing the service, a correspondence table between devices to be used is created for each user and separately managed. Accordingly, even when some devices and software are shared by a plurality of users in the case where the same service is provided for the plurality of users in the same sitearea, progress management and device management in providing the service are independently performed for each user, and therefore do not interfere with each other.

Please replace paragraph [0057] with the following amended paragraph:

[0057] The main components of the system are a service scenario distribution server 0701, a broker server 0702 placed in an sitearea where a user 0710 is, sensors 0707 placed in the

sitearea where the user 0710 is and coupled to the broker server 0702 through a field network, and an access point 0708. The service scenario distribution server 0701 distributes the service scenario for providing the service. The sensor 0707 is for knowing the situations of a device 1 (0704), a device 2 (0705), a device 3 (0706), and a device 4 (0709), as well as the situation in the environment. The access point 0708 is for allowing the user 0710 to communicate with the service scenario distribution server 0701 and the broker server 0702. The broker server 0702 manages a device management database 0703 storing information concerning the devices located in the sitearea. When there is a request for a service from the user, the broker server 0702 receives a service scenario 0711 from the service scenario distribution server 0701.

Please replace paragraph [0059] with the following amended paragraph:

[0059] FIG. 9 is a table showing information stored in the device management database, which is managed by the broker server according to the present invention. The main components of the information are a name of a device 0901 which is located in the sitearea managed by the broker server, a name of a function 0902 which the relevant device has, an attribute 0903 such as a specification of the device and an interface of the function, an identifier 0904 for specifying the relevant function and device on the network, and a state 0905, showing an operating situation of the device. Herein, the device 0901 includes not only one function 0902, but in some cases, includes a plurality of functions 0902. The attribute 0903, the identifier 0904, the state 0905 can be described for each function. These pieces of information are updated when the broker server regularly, acquires information on each device or when, each device regularly reports the state thereof to the broker server.

Please replace paragraph [0068] with the following amended paragraph:

[0068] FIG. 12 shows a configuration of middleware for dynamically linking devices necessary for the service in providing the service according to the present invention. In a device 1210 within the environment, together with an application 1208 for providing the service, middleware 1201 is present to link devices. The main components of the middleware 1201 are a device linkage creating section 1202, a service managing section 1203, a context managing section 1204, a device state managing section 1205, and a destination controller 1206. The

device linkage creating section 1202 creates a correspondence table 1209 of linkages between devices to be used for providing the service. The service managing section 1203 manages the service scenario and the execution of the service. The context managing section 1204 manages contexts in the sitearea. The device state managing section 1205 manages the states of the devices. The destination controller 1206 determines a destination of output data from the application 1208 according to the device linkages and the contexts. Herein, this correspondence table 1209 of device linkages is that shown in FIG. 6. When this middleware is applied to a system with the system configuration shown in FIG. 7 excluding the broker server 0702 and the device management database 0703 in the case of providing the video streaming distribution service as a concrete application example similarly to FIGS. 7 to 11, the service application as shown in FIG. 10 can be applied in the same manner as described earlier.

Please replace paragraph [0069] with the following amended paragraph:

[0069] The service managing section 1203 receives a service scenario through a communication medium 1207. The context managing section 1204 acquires information from sensors installed within the environment through the communication medium 1207 and thereby always monitors changes in the contexts in the sitearea. The device state managing section 1205 manages operating situations, usage situations, and the like of the devices.

Please replace paragraph [0074] with the following amended paragraph:

[0074] FIG. 14 is a view showing a way of managing devices and functions when a plurality of users simultaneously receive the services in the same sitearea in providing the services according to the present invention. There are five devices 1401, 1402, 1403, 1404, and 1405, each having a plurality of functions (1411 to 1413, 1421 to 1424, 1431 to 1434, 1441 and 1442, 1451 to 1453, respectively). The services are simultaneously provided to two users. One user is provided with the service by the combination of the functions 1411, 1422, 1431, and 1452, and the other user is provided with the service by the combination of 1413, 1434, and 1442. Herein, the device 3 (1401) is shared by the two users. However, the service execution is managed by the correspondence tables of device linkages prepared for the respective users. Accordingly, even when the service for one user is finished, it does not occur that the right for

operating the shared device 3 (1401) is released, and the service being provided for the other user is stopped.

Please replace paragraph [0075] with the following amended paragraph:

[0075] FIG. 15 is a flowchart in selecting devices necessary for the service in providing the service according to the present invention. In ST1501, a local sitearea is searched for devices having functions necessary for the service based on the service scenario. In ST1502, when all the devices having the functions necessary for the service are detected as a result of the search and the detected devices are available, the service is executed in ST1506. On the contrary, in the ST1502, when not all the devices having the functions necessary for the service are detected, the sitearea is searched for substitute devices in ST1503. In ST1504, when all the devices having the necessary functions are prepared by adding the substitute devices that are detected, the service is executed in ST1506. Note that the service provided here is one at the same level as that described in the service scenario. When not all the devices having the necessary functions are prepared even by adding the detected substitute devices in ST1504, the configuration is restructured so as to execute the service with only the prepared functions and devices, thus executing the, service in ST1506. Herein, the level of the service is restricted depending on the prepared devices.

Please replace paragraph [0079] with the following amended paragraph:

[0079] The main components of the system are a service scenario distribution server 1701, a broker server 1706 placed in a site an area where a user 1709 is, sensors 1707 placed in the sitearea where the user 1709 is and coupled to the broker server 1706 through a field network, and an access point 1708. The service scenario distribution server 1701 distributes the service scenario for providing the service. The sensors 1707 are for knowing the situations of a device 1 (1702), a device 2 (1703), a device 3 (1704), and a device 4 (1705), as well as the situation in the environment. The access point 1708 is for allowing the user 1709 to communicate with the service scenario distribution server 1701 and the broker server 1706. The service scenario 1711 is a service scenario for the video streaming distribution service shown in FIG. 8.

Please replace paragraph [0080] with the following amended paragraph:

[0080] The service scenario 1711 for the video streaming distribution service is sent from the service scenario distribution server 1701 upon request for the service from the user 1709. The sent service scenario 1711 is first downloaded in any one of the devices having the functions described in the service scenario in the sitearea where the user 1709 is. Thereafter, the devices necessary to execute the service are selected based on the service scenario 1711 by exchange of information between the devices, and the correspondence table between the devices is created.

Please replace paragraph [0091] with the following amended paragraph:

[0091] According to the present invention, since the service and the devices can be separately managed, it is unnecessary to take into account the devices to be actually used when designing the service. Moreover, it is possible to provide the same services in many siteareas with no burden without preparing the same pieces of equipment for the services, and it is possible to increase the variations of a service which can be provided in one sitearea.